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ALSTON & BIRD LLP
BANK OF AMERICA PLAZA
101 SOUTH TRYON STREET, SUITE 4000
CHARLOTTE, NC 28280-4000

EXAMINER

RUGGLES, JOHN S

ART UNIT PAPER NUMBER

1756

DATE MAILED: 06/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No. 10/016,277	Applicant(s) WU, PETER HSIUEN	
Examiner John Ruggles	Art Unit 1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 02 November 2001.
- 2a) This action is FINAL.
- 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-63 is/are pending in the application.
4a) Of the above claim(s) 50-63 is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-49 is/are rejected.
- 7) Claim(s) 6 and 34 is/are objected to.
- 8) Claim(s) 1-63 are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 02 November 2001 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) Interview Summary (PTO-413) Paper No(s) _____.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other:

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-49, drawn to a method of protecting selected portions of a metal substrate followed by chemical treatment, classified in class 216, subclass 42.
- II. Claims 50-63, drawn to a coated metal substrate, classified in class 428, subclass 195.

Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make another and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed can be made by another and materially different process, such as by applying an etching mask to a metal substrate without exposing to actinic radiation, followed by coating with a line sealant without subjecting the coated substrate to any further chemical treatment.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with Christopher Humphrey on 22 May 2003 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-49. Affirmation of this election must be made by applicant in replying to this Office action. Claims

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50-63 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Drawings

New corrected drawings are required in this application because: Figures 1 and 2 have been objected to by the draftsman (see the attached PTO 948 for the draftsman's review). Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Specification

The disclosure is objected to because of the following informalities: --1-hydroxycyclohexylphenyl ketone--, --bis (2,6-dimethylbenzoyl) 2,4,4-trimethylpentyl phosphine oxide-- (which is the photoinitiator compound included in IRGACURETM 1700 as shown at column 4, lines 25-29 of Sokol, US Patent 5,773,487), and --IRGACURETM-- are misspelled at lines 10-13 on instant page 6 and at line 7 on instant page 8.

Appropriate correction is required.

The use of the trademarks "SARTOMERTM", "IRGACURETM", and "ESACURETM" has been noted in this application. They should be capitalized wherever they appear and be accompanied by the generic terminology.

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Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

Claim Objections

Claims 6 and 34 are objected to because of the following informalities: --1- hydroxycyclohexylphenyl ketone-- and --bis (2,6-dimethylbenzoyl) 2,4,4-trimethylpentyl phosphine oxide-- (see the referenced lines of Sokol pointed out above) are misspelled. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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Claims 11-12, 14, 28, 39-40, 42, and 48-49 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. The proper units for recited limitations or at least an explanation of how these limitations can be compared to standard criteria therefore are critical or essential to the practice of the invention, but are not included in the claim(s) nor enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). Specifically, proper units are required for: (1) the exposure intensity recited in claims 11, 28, and 39; (2) the duration of exposure (even if combined with intensity and specified as overall dosage) recited in claims 12 and 40; and (3) the peel strength recited in claims 14, 42, and 48. Claim 49 is dependent on claim 48. The peel strength recited as "oz./inch" is not enabled because the mass (representing force) required for peeling a specified area of the removable coating has not been specified (e.g., the amount of force needed to remove a specified area of coating material should have been specified or at least enough information given to derive it, etc.). One way to interpret this peel strength limitation is that resulting from a peeled area 1 inch wide such that every inch of linear travel during peeling would represent a peel strength equal to the applied force (represented by mass/inch²), which could then have been expressed as --oz./inch for a 1 inch wide strip--. Even though this additional clarifying limitation for the peeling strength is not supported by the instant specification, the examiner has taken this interpretation for the purpose of this Office action in order to allow treatment of claims 14, 42, and 48-49 on the merits. However, claims 11-12, 28, and 39-40 have not been further treated on the merits.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 11-12, 14, 28, 39-40, 42, and 48-49 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 11, 28, and 39, the metes and bounds of the exposure intensity units that are recited as "W/cm" are not clear because the area exposed to this intensity has not been specified (e.g., an intensity or dosage recited as --W/cm²-- should have been specified, etc.). Accordingly, claims 11, 28, and 39 have not been further treated on the merits.

Similarly, in claims 12 and 40, the metes and bounds of the rate of exposure units that are recited as "feet/minute" are not clear because the exposure time for curing the coating has not been specified (e.g., the amount of time in minutes that each point of the coating is exposed for curing should have been specified, etc.). Accordingly, claims 12 and 40 have not been further treated on the merits.

Likewise, in claims 14, 42, and 48, the metes and bounds of the peel strength, which is recited as "oz./inch", are not clear for the reasons discussed above. Claim 49 is dependent on claim 48. However, claims 14, 42, and 48-49 have been interpreted as discussed above in order to allow them to be treated on the merits.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 7-8, 13-15, and 17-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Maeda, et al. (US Patent 5,466,739).

Maeda teaches a peelable radiation curable maskant composition optionally including a polymerizable acrylate with talc or silica filler (instant claims 7-8) and a process of chemically milling a metal aircraft part using the maskant (column 1, lines 10-21, column 3, lines 51-60, and column 5, lines 48-51). Note that the polymerizable acrylate is understood to include diacrylate, urethane acrylate and/or urethane diacrylate (instant claim 4). At column 1, lines 33-34 and column 7, lines 28-31, the metal of the part is described as aluminum (Al), iron (Fe), titanium (Ti), and/or the like, which is understood to include alloys thereof (instant claim 2). The process of chemically milling the metal part involves: (1) coating the maskant onto the metal by spraying, rolling, or immersion (instant claim 15); (2) drying the coating by far infrared rays, which suggests the use of a photoinitiator and is considered to be actinic by causing or accelerating polymerization to form a cured maskant film (instant claim 3); (3) scribing the maskant to allow peeling away of unneeded maskant portions; and (4) etching through the maskant for chemically milling selected portions of the metal substrate, optionally in plural separate stages of scribing additional portions of the maskant for removal and further etching through the maskant (column 7, line 33 to column 8, line 12, instant claims 1 and 17-18). The cured maskant film thickness is 100-800 μm , which correlates to 4-31 mils (column 7, lines 25-27, fully encompassing the 5-20 mils of instant claim 13). After etching, the peeling strength of 1 inch wide strips of maskant giving "good" results were measured in the range of 200-1,200

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g/inch as shown in Table 2 (columns 11-12), which correlates to a peeling strength of 7-42 oz./inch (instant claim 14).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5-6 and 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda in view of Sokol (US Patent 5,773,487).

While teaching the use of a radiation polymerizable monomer in the category of acrylates for the maskant, Maeda does not teach (1) at least one of the specific monomers of instant claim 5 and (2) at least one of the specific photoinitiators of instant claim 6.

However, combinations of these acrylate monomers and photoinitiators are known for radiation curable acrylate coatings as shown by Sokol at column 3, line 44 to column 4, line 29 (instant claims 5-6). These coating combinations provide quick curing upon exposure to ultraviolet (UV) light, sunlight, or electron beams (column 2, lines 41-44, instant claim 9). In column 6, lines 1-2, UV light can be generated using typical factory lighting, which is considered to include movable light sources (instant claim 10).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute any of the radiation curable acrylate coating compositions of Sokol for

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the maskant in the process of Maeda with the lighting for curing as shown by Sokol in order to obtain quick curing of the polymerizable acrylate maskant.

Claims 16, 19-21, 26, 29-32, 35, 41-42, and 43-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda in view of either Blake (US Patent 5,126,005) or Jaffe, et al. (US Patent 4,585,519).

While teaching radiation curable acrylate masking to a thickness of 4-31 mils (having a peeling strength of 7-42 oz./inch for a 1-inch wide strip) and chemical treatment of an Al, steel, or Ti metal aircraft part, Maeda does not specifically teach masking both sides of the metal aircraft part and subsequently resealing scribed cut lines of the mask before chemically milling.

Blake shows coating both sides of a metal aircraft part with maskant layers and overcoating with a plastic film, selective removal of portions of the plastic and maskant layers, and subsequent chemical milling and anodizing of the metal part (column 3, line 7 to column 4, line 13).

Jaffe describes a process of chemically milling a metal aircraft part by masking the metal part (column 5, lines 50-53), scribing the mask with a pattern, marking the scribed cuts, resealing the scribed lines (column 9, lines 36-40), removing (e.g., by peeling, etc.) the scribed portions of the mask, and etching (optionally in separate steps of scribing and etching different portions of the metal part, column 9, lines 58-60). All surfaces of the metal part should be masked except those areas to be chemically milled (column 11, lines 19-24). The sealant may be the same material as that of the mask or any other sealant material, which is both compatible with the mask and capable of withstanding the etching step(s) (column 12, lines 30-33). Also, the sealant

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may be applied with a roller, brush, or other fluid dispenser as may be desired, depending on the flow characteristics of the sealant material (column 12, lines 33-37).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the masking (having a peeling strength of 7-42 oz./inch for a 1-inch wide strip, instant claim 42) and chemical treatment (milling) taught by Maeda with the double-sided masking and chemical treatment either shown by Blake (further coating of mask, then scribing, milling, and anodizing) or described by Jaffe (resealing scribed lines and milling). It would also have been obvious to apply the sealant material (e.g., by rolling, etc.) as described by Jaffe. This is because Maeda, Blake, and Jaffe all relate to the same art of masking and chemical treatment of a metal aircraft part.

Claims 22-23, 27, 33-34, 37-38 and 48-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda in view of either Blake or Jaffe, and further in view of Sokol.

While teaching the use of a radiation polymerizable monomer in the category of acrylates for the maskant and/or sealant, Maeda and either Blake or Jaffe do not teach (1) at least one of the specific monomers of instant claims 22 and 33, (2) at least one of the specific photoinitiators of instant claims 23 and 34, and (3) curing the line sealant by UV, black light, or visible radiation.

However, combinations of these acrylate monomers and photoinitiators are known for radiation curable acrylate coatings, which are quickly cured by exposure to UV light or sunlight as shown by Sokol and discussed above.

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute any of the radiation curable acrylate coating compositions, which are cured by UV light or sunlight as shown by Sokol for the maskant (having a peeling strength of 7-42 oz./inch for a 1-inch wide strip, instant claims 48-49) and/or sealant in the process of Maeda and either Blake or Jaffe in order to obtain quick curing of the polymerizable acrylate maskant and/or sealant as shown by Sokol.

Claims 24-25 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda in view of either Blake or Jaffe, further in view of Sokol, and further in view of Snowwhite, et al. (US Patent 6,136,880).

While teaching use of radiation polymerizable acrylate and photoinitiator combinations for the maskant and/or sealant, Maeda, either Blake or Jaffe, and Sokol do not teach the addition of a wax and a triethanolamine synergist.

Snowwhite discloses radiation curable and removable protective coating compositions having many of the same acrylate monomer(s) and/or photoinitiator(s) as shown by Sokol and discussed above along with additives of wax to exclude oxygen (O₂) and at least one accelerator or synergist including triethanolamine, which also helps to overcome the inhibiting effect of O₂ (column 16, line 58 to column 17, line 11).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute any of the radiation curable acrylate coating compositions of Sokol along with the additives of wax and triethanolamine synergist as disclosed by Snowwhite for the maskant and/or sealant in the process of Maeda and either Blake or Jaffe in order to obtain quick

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curing of the polymerizable acrylate maskant and/or sealant as taught by Sokol and also to overcome the inhibiting effect of O₂ as disclosed by Snowwhite.

Claim 47 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda in view of either Blake or Jaffe, and further in view of Gnanamuthu, et al. (US Patent 4,716,270).

While teaching masking, mechanically scribing (e.g., with a knife, etc.), subsequent coating or sealing, peeling away cutout maskant, and chemical treatment, Maeda and either Blake or Jaffe do not teach performing the scribing step alternatively with a laser.

Gnanamuthu teaches masking of a metal aerospace part, scribing a pattern in the maskant, peeling away cutout portions of the maskant, repairing cut edges of the maskant by resealing to the metal (e.g., tacking the maskant back down to the metal by solvent wetting, etc.), chemically milling the metal through the maskant pattern, and removing remaining maskant (column 1, lines 28-58). The maskant scribing is alternatively performed with a laser (column 4, lines 3-4). Laser scribing of the maskant reduces labor costs, avoids scoring of the metal underlying the maskant, and does not adversely affect the adhesion of the remaining maskant so that there is no premature lift-off or peel-back of the remaining maskant before chemical milling (column 2, lines 35-50).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute laser scribing as taught by Gnanamuthu for the mechanical scribing of the maskant as taught by Maeda and either Blake or Jaffe, because they all relate to the same art of masking and chemically milling a metal aircraft or aerospace part. In addition, laser scribing of the maskant reduces labor costs, avoids scoring of the metal underlying the maskant, and does

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not adversely affect the adhesion of the remaining maskant so that there is no premature lift-off or peel-back of the remaining maskant before chemical milling as pointed out by Gnanamuthu.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Ruggles whose telephone number is 703-305-7035. The examiner can normally be reached on Monday-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 703-308-2464. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.


MARK F. HUFF
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700


John Ruggles
Examiner
Art Unit 1756